

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently Amended) A method of purging a semiconductor manufacturing apparatus, comprising:

a step of etching a CVD-deposited film deposited in a chamber constituting a semiconductor manufacturing apparatus which has performed a process of forming a CVD film using a CVD method over a semiconductor wafer, by using ~~an etching~~ a cleaning gas containing at least a halogen gas; ~~[[and]]~~

a step of purging ~~[[a]]~~ the cleaning gas remaining in the chamber by causing a gas containing hydrogen to flow into the chamber after the step of etching the CVD-deposited film by using the cleaning gas; and

monitoring the cleaning gas remaining in the chamber to detect completion of the purge of the cleaning gas.

2. (Original) The method of purging a semiconductor manufacturing apparatus according to claim 1, wherein the gas containing the hydrogen in the step of purging is a mixed gas of hydrogen and nitrogen.

3. (Original) The method of purging a semiconductor manufacturing apparatus according to claim 2, wherein the content of the hydrogen of the mixed gas in the step of purging is in a range of approximately 10 sccm to approximately 10 slm, and the content of the nitrogen of the mixed gas is in a range of from 0 sccm to approximately 10 slm.

4. (Original) The method of purging a semiconductor manufacturing apparatus according to claim 1, wherein the cleaning gas in the step of etching is a ClF_3 gas.

5. (Currently Amended) A method of purging a semiconductor manufacturing apparatus, comprising:

a step of etching a CVD-deposited film deposited in a chamber constituting a semiconductor manufacturing apparatus which has performed a process of forming a CVD film using a CVD process over a semiconductor wafer, by using ~~an etching a~~ cleaning gas containing at least a halogen gas; [[and]]

a step of purging [[a]] the cleaning gas remaining in the chamber by causing a gas containing water-vapor to flow into the chamber after the step of etching the CVD-deposited film by using the cleaning gas[.]; and

a step of monitoring the cleaning gas remaining in the chamber to detect completion of the purge of the cleaning gas.

6. (Original) The method of purging a semiconductor manufacturing apparatus according to claim 5, wherein the gas containing the water-vapor in the step of purging is a mixed gas of water-vapor and nitrogen.

7. (Original) The method of purging a semiconductor manufacturing apparatus according to claim 6, wherein the content of the water-vapor of the mixed gas in the step of purging is in a range of approximately 5 sccm to approximately 500 sccm, and the content of the nitrogen of the mixed gas is in a range of from 10 sccm to approximately 10 slm.

8. (Original) The method of purging a semiconductor manufacturing apparatus according to claim 5, wherein the cleaning gas in the step of etching is a ClF_3 gas.

9. (Currently Amended) A method of purging a semiconductor manufacturing apparatus, comprising:

a step of etching a CVD-deposited film deposited in a chamber constituting a semiconductor manufacturing apparatus which has performed a process of forming a CVD film using a CVD process over a semiconductor wafer, by using ~~an etching a~~ cleaning gas containing at least a halogen gas; and

a step of purging ~~[[a]]~~ the cleaning gas remaining in the chamber by causing a gas containing a substance, which becomes alkali upon being dissolved in water, to flow into the chamber after the step of etching the CVD-deposited film by using the cleaning gas ~~after the step of etching the CVD-deposited film by using the cleaning gas;~~ and

a step of monitoring the cleaning gas remaining in the chamber to detect completion of the purge of the cleaning gas.

10. (Original) The method of purging a semiconductor manufacturing apparatus according to claim 9, wherein the gas containing the substance that becomes alkali upon being dissolved in water in the step of purging is a mixed gas of substance that becomes alkali upon being dissolved in water and nitrogen.

11. (Original) The method of purging a semiconductor manufacturing apparatus according to claim 9, wherein the cleaning gas in the step of etching is a ClF_3 gas.

12. (Currently Amended) A method of purging a semiconductor manufacturing apparatus, comprising:

a step of etching a CVD-deposited film deposited in a chamber constituting a semiconductor manufacturing apparatus which has performed a process of forming a CVD film using a CVD process over a semiconductor wafer, by using an etching a cleaning gas containing at least a halogen gas; [[and]]

a step of purging [[a]] the cleaning gas remaining in the chamber by causing ammonia to flow into the chamber after the step of etching the CVD-deposited film by using the cleaning gas[.]; and

a step of monitoring the cleaning gas remaining in the chamber to detect completion of the purge of the cleaning gas.

13. (Original) The method of purging a semiconductor manufacturing apparatus according to claim 12, wherein the ammonia in the step of purging is a mixed gas of ammonia and nitrogen.

14. (Original) The method of purging a semiconductor manufacturing apparatus according to claim 13, wherein the content of the ammonia in the step of purging is in a range of approximately 100 sccm to approximately 2 slm, and the content of the nitrogen of the mixed gas is in a range of from 10 sccm to approximately 10 slm.

15. (Original) The method of purging a semiconductor manufacturing apparatus according to claim 12, wherein the cleaning gas in the step of etching is a ClF_3 gas.

16. (Original) The method of purging a semiconductor manufacturing apparatus according to claim 12, wherein the temperature in the chamber when ammonia is caused to flow into the chamber is approximately 800°C or higher.

17. (Original) A method of manufacturing a semiconductor device comprising:

a step of mounting a semiconductor wafer in a chamber purged using the method of purging a semiconductor manufacturing apparatus according to any one of claims 1 to 4; and

a step of forming a CVD film over the semiconductor wafer mounted in the chamber.

18. (Original) A method of manufacturing a semiconductor device comprising:

a step of mounting a semiconductor wafer in a chamber purged using the method of purging a semiconductor manufacturing apparatus according to any one of claims 5 to 8; and

a step of forming a CVD film over the semiconductor wafer mounted in the chamber.

19. (Original) A method of manufacturing a semiconductor device comprising:

a step of mounting a semiconductor wafer in a chamber purged using the method of purging a semiconductor manufacturing apparatus according to any one of claims 9 to 11; and

a step of forming a CVD film over the semiconductor wafer mounted in the chamber.

20. (Original) A method of manufacturing a semiconductor device comprising:

a step of mounting a semiconductor wafer in a chamber purged using the method of purging a semiconductor manufacturing apparatus according to any one of claims 12 to 16; and

a step of forming a CVD film over the semiconductor wafer mounted in the chamber.

21. (New) The method of purging a semiconductor manufacturing apparatus according to claim 1, wherein the monitoring of the cleaning gas is carried out by mass spectroscopy of the cleaning gas remaining in the chamber.

22. (New) The method of purging a semiconductor manufacturing apparatus according to claim 1, wherein in the purging of the cleaning gas, pressure in the chamber is changed to change an exhaust rate of the cleaning gas.

23. (New) The method of purging a semiconductor manufacturing apparatus according to claim 1, wherein the pressure is changed to vary in the range of three digits or more.

24. (New) The method of purging a semiconductor manufacturing apparatus according to claim 1, wherein temperatures of the chamber and an exhaust tube connected to the chamber in the purging of the cleaning gas are set higher than temperatures applied thereto in the forming of the CVD film.

25. (New) The method of purging a semiconductor manufacturing apparatus according to claim 1, wherein the cleaning gas remaining in the chamber is used as a doping gas in a subsequent step.

26. (New) The method of purging a semiconductor manufacturing apparatus according to claim 5, wherein the monitoring of the cleaning gas is carried out by mass spectroscopy of the cleaning gas remaining in the chamber.

27. (New) The method of purging a semiconductor manufacturing apparatus according to claim 5, wherein in the purging of the cleaning gas, pressure in the chamber is changed to change an exhaust rate of the cleaning gas.

28. (New) The method of purging a semiconductor manufacturing apparatus according to claim 5, wherein the pressure is changed to vary in the range of three digits or more.

29. (New) The method of purging a semiconductor manufacturing apparatus according to claim 5, wherein temperatures of the chamber and an exhaust tube connected to the chamber in the purging of the cleaning gas are set higher than temperatures applied thereto in the forming of the CVD film.

30. (New) The method of purging a semiconductor manufacturing apparatus according to claim 5, wherein the cleaning gas remaining in the chamber is used as a doping gas in a subsequent step.

31. (New) The method of purging a semiconductor manufacturing apparatus according to claim 9, wherein the monitoring of the cleaning gas is carried out by mass spectroscopy of the cleaning gas remaining in the chamber.

32. (New) The method of purging a semiconductor manufacturing apparatus according to claim 9, wherein in the purging of the cleaning gas, pressure in the chamber is changed to change an exhaust rate of the cleaning gas.

33. (New) The method of purging a semiconductor manufacturing apparatus according to claim 9, wherein the pressure is changed to vary in the range of three digits or more.

34. (New) The method of purging a semiconductor manufacturing apparatus according to claim 9, wherein temperatures of the chamber and an exhaust tube connected to the chamber in the purging of the cleaning gas are set higher than temperatures applied thereto in the forming of the CVD film.

35. (New) The method of purging a semiconductor manufacturing apparatus according to claim 9, wherein the cleaning gas remaining in the chamber is used as a doping gas in a subsequent step.

36. (New) The method of purging a semiconductor manufacturing apparatus according to claim 12, wherein the monitoring of the cleaning gas is carried out by mass spectroscopy of the cleaning gas remaining in the chamber.

37. (New) The method of purging a semiconductor manufacturing apparatus according to claim 12, wherein in the purging of the cleaning gas, pressure in the chamber is changed to change an exhaust rate of the cleaning gas.

38. (New) The method of purging a semiconductor manufacturing apparatus according to claim 12, wherein the pressure is changed to vary in the range of three digits or more.

39. (New) The method of purging a semiconductor manufacturing apparatus according to claim 12, wherein temperatures of the chamber and an exhaust tube connected to the chamber in the purging of the cleaning gas are set higher than temperatures applied thereto in the forming of the CVD film.

40. (New) The method of purging a semiconductor manufacturing apparatus according to claim 12, wherein the cleaning gas remaining in the chamber is used as a doping gas in a subsequent step.